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ENGR110/210
Perspectives in Assistive Technology

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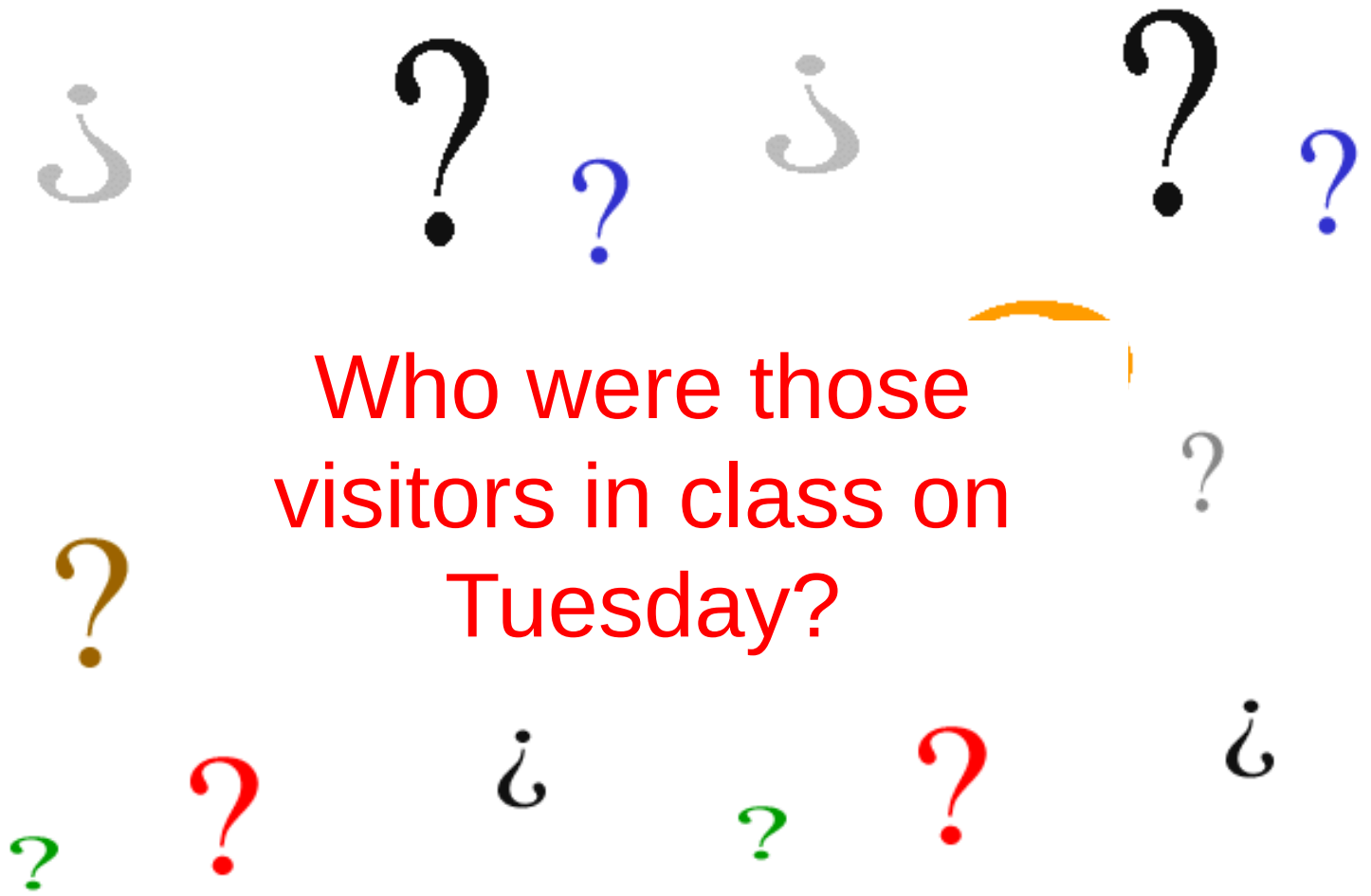
Questions?



Agenda

- Mid-term presentations in two weeks
- Discussion – No-Fall Cane
- Presentations by Jules Sherman & Nicole Torcolini
- After-class demo

Mid-term Presentation

- Logistics
  - All team members should participate
  - Eight minute presentations by eight teams
  - Email PowerPoint slides the day before
  - Make slides of sketches and prototypes
  - Post videos on YouTube and link to url in a slide
  - Bring physical prototypes
  - Practice your presentation for timing and choreography
  - In-class evaluation

Mid-term Presentation

- Outline
  - Introduction of team and its members
  - Brief abstract
  - Statement of problem
  - Magnitude of problem addressed by this project
  - Discussion of interviews with those who suggested the project and potential users
  - Statement of specific need
  - Identification of existing solutions and discussion of their limitations
  - Description of brainstormed design concepts
  - Analysis of top considered design alternatives
  - Description of selected design(s), including its technical feasibility, engineering difficulty, estimated cost, user acceptance, safety considerations, etc
  - Design visualizations: photographs, videos, sketches, drawings, models, and prototypes
  - Future work and challenges for continuing the project toward fabrication and testing with users

Mid-term Presentation

- Discuss
  - Project status: what has been done, what remains
  - Problems encountered, resolved, and pending
  - Plans for the remainder of the quarter

Evaluation Items

Overall quality of:

1. Presentation
2. Effectiveness of design process
3. Progress toward a design solution

Presentation Metrics

Quality of information presented

- Clarity
- Organization
- Completeness

Design Process Metrics

- Problem identification
- Research
- Brainstorming
- Collaboration with project suggestor and user(s)
- Design concepts
  - Selection
  - Prototyping
  - Testing
  - Evaluation

Design Concept Metrics

- Creativity
- Originality
- Functionality
- Extent design meets user’s needs

No-Fall Cane Project - 2011

Problem: Many individuals, especially older adults with gait disturbances, balance disorders, joint replacements, etc need assistive devices such as walkers or canes to provide stability while walking, standing, sitting down, and getting up.

Although walkers provide stability, they are both bulky and embarrassing to use. They must be folded and put into the trunk of the car, or at least in the back seat. Many people would rather stay home than use a walker in public. In addition, educating people to use walkers correctly so they are not "hunched over" is a persistent problem.

Canes are more portable, lighter in weight, easier to manage, and much less of an embarrassment. However, **one significant problem with canes is that they are they are always falling down when they are not being used!** Canes placed against a wall or a table inevitably slide to the ground. People who use canes are not often able to bend over safely to pick them up.

While quad canes provide more stability and can stand on their own, they are very unsafe, as people often trip over them when they step forward.

Robin Tobias

Cane Dilemma

No-Fall Cane Project

Aim: The aim of this project is to explore designs for a normal, one-pointed cane that **does not fall over**.

Specifications: The design must be lightweight and very simple. It most likely will have some internal mechanism to prevent it from falling over. Ideally it would stand freely on the ground even if not being held. For example, a cane user could put it next to their bed and when they get up at night to go to the bathroom it would standing right there. And if they accidentally lost their grip on the cane, it would not fall over. It should be very affordable, as many cane users are on fixed incomes. A design that is aesthetically pleasing would promote its use.

What's Available?

Quad cane

Ultra stable cane tip

Wheeled quad cane

Quad cane base

Quad cane pod tip

Quad cane tip

Brainstormed Design Concepts

- Automatic deploying tripod stand
- Active balance system
- Stability through rotation

HurryCane

[The HurryCane]

HurryCane Design

- What do you think of the design?
  - Strengths
  - Weaknesses
- How much do you think it costs?
- What is the value of the Certificate of Authenticity?
- Do you think it worked for the user?

Test Results

Robin Tobias – “We received the HurryCane and couldn't wait to open the package. Turns out it is very poorly designed - the base has three little points of weight bearing, supposedly to increase the stability. But it wouldn't stand on its own, just on the carpet in my office. And if you touch it, it falls right over. It does have a wrist-strap.”

What went wrong?

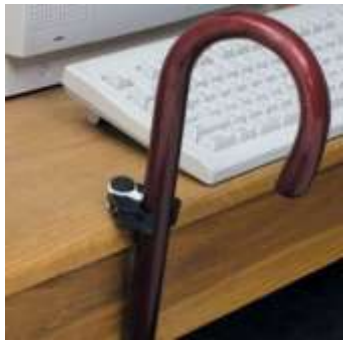
1. “One-pointed tip” specification prevented team from considering large base design concepts. (The team did consider simple solutions to secure the cane in the home.)

2. Commercial product only works on smooth, level surfaces and has limited range of stability

Other Solutions

Clu Clip

Video



Mabis Cane Holder

Ingrid Cane Clip Holder

Retractable key chain

Spring clip cane holder

Dabo cane holder

Tuesday

Stanford's Office of Accessible Education

Teri A. Adams, JD

Today

Perspectives of Stanford Graduates

Jules Sherman & Nicole Torcolini

Short Break


Class
Dismissed!